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THE RISK OF BEING UNSYSTEMATIC AND STOCK RETURNS: THE EMPIRICAL TEST ON CAPITAL VALIDITY OF CAPITAL ASSET PRICING MODEL

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Abstract

The objective of this research is to analyze the effect of idiosyncratic risk to stock return on Indonesia Stock Exchange. To test these variables, the study applied two pass regression with time series data of stock return LQ45 and stock price index from January 2014 - December 2014. The estimation method used in the first pass regression was selected by characteristics of the return data, that is EGARCH (1,1) method for heterokedasticity data and Ordinary Least Squares for constant variance data. Specifications on the second pass regression models using cross section data, that is month by month cross sectional regression of 30 stock portfolios, which aim to identify unsystematic risk role in explaining the behavior of the return from stock portfolio. The findings of this study indicate that unsystematic risk has insignificant effect on stock return. These findings support the statement postulated in Capital Asset Pricing Model (CAPM), that the only relevant risk in explaining the return of stock only systematic risk, so there is no statistical evidence is strong enough to declare that the unsystematic risk can play a role in explaining the movement of stock return.

Keywords: Stock return, Beta, Idiosyncratic risk, CAPM

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh dari risiko idiosinkratik terhadap imbal hasil saham di Bursa Efek Indonesia. Untuk menguji variabel tersebut, peneliti mengaplikasikan *two pass regression* dengan menggunakan data *time series* dari *return* saham LQ45 dan Indeks Harga Saham Gabungan (IHSG) dalam periode Januari 2014 – Desember 2014. Metode estimasi yang digunakan pada *first pass regression* dipilih berdasarkan karakteristik data *return* yaitu metode EGARCH (1,1) untuk data yang bersifat heterokedastik dan Ordinary Least Squares untuk data yang variansnya konstan. Spesifikasi model pada *second pass regression* dengan menggunakan data *cross section* merupakan *month by month cross sectional regression* dari 30 portfolio saham, yang bertujuan untuk mengidentifikasi peran risiko idosinkratik dalam menjelaskan perilaku *return* dari portfolio saham.
Hasil penelitian ini menunjukkan bahwa risiko idiosinkratik tidak berpengaruh signifikan terhadap imbal hasil saham. Penemuan ini mendukung pernyataan yang dipostulasikan dalam CAPM, bahwa satu-satunya risiko yang relevan dalam menjelaskan *return* suatu saham hanya risiko sistematik, sehingga tidak terdapat bukti statistik yang cukup kuat untuk menyatakan bahwa risiko idiosinkratik dapat berperan dalam menjelaskan pergerakan imbal hasil saham.

Kata kunci: *Return* saham, Beta, Risiko idiosinkratik, CAPM

JEL Classification: G1, G12, N25

1. Research Background

The capital market acts as a bridge for inverstors and emitten. Investors with excess funds can invest their capital on various ventures within the capital market with the hope of receiving stock returns. Return indicates the level of repayment that investors enjoy while risk is the amount of deviation from the return that is hoped from such securities. Within theories of investment, it is stated that every security yields returns and poses certain risks. Investors who hope to reap high returns are also faced with high risk. Every security possess differing levels of risk while investors also adopt differing perspectives, and one of the considerations in investment is risk minimalization. Investor with a realistic perspective will invest in more than one type of investments and will diversify to minimize risk for certain returns. On the other hand, rational investors will (1) make decisions based upon an analysis of the capital market at the time, (2) create an optimal portfolio, (3) collate investment policies, (4) implement strategies, and (5) monitor and supervise the performance of investment managers.

There are two risk components in securities, which are unsystematic risk (also referred to ask specific risk and/or idiosyncratic risk) or diversifiable risk and systematic risk or nondiversifiable risk. In capital asset pricing model (CAPM), systematic risk becomes a primary risk factor used to measure the return due to various changes that takes place within the macroeconomic financial condition reflected in the market return variation and diversification of security by investors have removed all influences of unsystematic risk. The systematic risk of a security that cannot be diminished through diversification is measured using a beta. Beta security shows the sensitivity of said returns against the changes in the return of a larger portfolio. The bigger the systematic risk, the bigger the return sensitivity of the security towards the changes in the market returns. Unsystematic risk reflects specific information about the company and will fluctuate according to the company’s own information. A few factors such as announcement of earnings, seasonal supply and demand, and competition dynamics can cause this to happen. As such, naturally, this risk will time-varyingly change dependent upon the changes of such information (Naomi, Prima, 2011).

Diversification strategy is imperative for investors. The purpose of diversifying security is to remove risk that could be diversified. Measuring returns or risk for an individual security is important, however, for portfolio managers, returns and risk within the entirety of the portfolio is more necessary as diversification could yield large profits. Portfolio diversification can also be interpreted as the creation of portfolio that minimizes the risk without sacrificing the stock returns. Portfolio can be defined as a series of fixed assets invested and held by the financier, whether it be an individual or an institution. The formation of a portfolio begins with an attempt to diversify one’s investment to minimize risk. It has been proven that risk of deficit can be minimized by having a variety of investments in one’s portfolio. In the meantime, nondiversifiable risk will stay with every individual security. As such, if attempt has been made in the portfolio, the security return should correlate positively with the nondiversifiable risk.

In their study, Copeland and Shastri (2005) proved that beta is the only factor that explains the rate of return of risky assets, and this is one of the important properties of capital asset pricing model (CAPM). The size of risk of an asset is highly dependent upon the level of sensitivity that the asset itself has towards the changes in the return market as measured by beta (Rachmat Sudarsono, et al., 2012). Multiple studies have shown the relationship between expected return asset with the systematic risk of the asset towards an equilibrium market, as seen in studies by Sharpe (1964), Lintner (1965), and Mosin (1966). At equilibrium, a well-diversified portfolio will only yield systematic risk that could be avoided by paying the premium while nondiversifiable risk will become irrelevant.

However, empirical research has shown inconsistent result in explaining the relationship between return and systematic risk. Additionally, other empirical studies have concluded that beta is dead because the findings of their empirical research have stated that beta is insignificant in explaining the behavior of returns. According to Lakonishok and Shapiro (1984), idiosyncratic risk or unsystematic risk is more capable of explaining the behavior of returns in comparison to systematic risk.

As such, the purpose of this study is to analyze the possibility of risk factor, aside from beta, that could explain returns in a share investment portfolio that refer to the CAPM theory, which states that the only risk that influences the investment of a share is a systematic risk. Thus, this study will look at unsystematic risk or idiosyncratic risk and its influence on stock returns. The beta estimation was conducted by examining the characteristic of the data of time-varying returns to avoid mismeasurement of the beta.

This study becomes interesting because the CAPM theory is the model most often used by financial practitioners to determine the cost of capital or to evaluate a security. However, various empirical researches have shown inconsistent findings in regards to the postulated relationship within this model.

1.1 Literature Review

In the past few decades, the development of financial theories has become one of the key factors in quantitavely examining risk. There are many ways to measure and determine financial risk accurately so that investors can allocate their funds to multiple securities. The risk of an individual asset can be separated into two parts: (1) systematic risk that measures how an asset will correlate with the market and (2) unsystematic risk that behaves independently against movements of the market. In this context, unsystematic risk is also known as idiosyncratic risk that is specific to every establishment.

Capital Asset Pricing Model postulates that the only relevant risk in measuring return is the systematic risk. Sharpe (1964), Lintner (1965), and Mosin (1966) developed the CAPM theory as a development of Markowitz' (1952) portfolio theory, which is a model that connects, expected return asset and the systematic risk of said asset.

Beginning with Markowitz' model, mean and variance return portfolio is shown as follows:

$$E(Rp) = aE(x) + bE(y)$$
$$var(Rp) = a^2 var(x) + b^2 var(y) + 2abr_{xy}\sigma_x\sigma_y$$

A minimal variance opportunity that is a combination of risk and returns that was given by a portfolio from risky asset yields minimal variance for certain returns. The form is decided upon the character of the correlation between assets within the portfolio. If the assets correlate positively, then the slope of the variance opportunity set will be as follows:

$$\frac{dE(Rp)}{d\sigma(Rp)} = \frac{E(x) - E(y)}{\sigma_x - \sigma_y}$$

The trade off between risk and return that is available for investors is constant. In general, a minimal variance opportunity set is a convex. If one of the assets within the portfolio possess zero variance then the mean and the variance of the portfolio becomes:

$$E(Rp) = aE(x) + (1 - a)R_f$$
$$var(Rp) = a^2 var\ x \rightarrow \sigma(Rp) = a\sigma_x$$

Where,

R_f = *Return dari risk free asset*

In this situation, the slope of the opportunity set:

$$\frac{d\ E(Rp)}{d\ \sigma(Rp)} = \frac{d\frac{E(Rp)}{da}}{d\frac{\sigma(Rp)}{da}} = \frac{E(x) - R_f}{\sigma_x}$$

Or:

$$\sigma(Rp) = a\sigma_x \rightarrow a = \frac{\sigma(Rp)}{\sigma_x}$$
$$E(Rp) = \frac{\sigma(Rp)}{\sigma_x} E(x) + \left[1 - \frac{\sigma(Rp)}{\sigma_x}\right] R_f$$
$$E(Rp) = R_f + \frac{\sigma(Rp)}{\sigma_x}\left[E(x) - R_f\right]$$
$$E(Rp) = R_f + \left[\frac{E(x) - R_f}{\sigma_x}\right]\sigma(Rp)$$
$$\frac{dE(Rp)}{d\sigma(Rp)} = \frac{E(x) - R_f}{\sigma_x}$$

From the slope above, it can be determined that the opportunity set will be linear.

Aside from opportunity set, there is the capital market line (CML) that is an efficient set for all investors and can show the linear relationship between risks and return portfolio. CML has intersect R_f *(risk free return)* and slope as follows:

$$\frac{E(R_m) - R_f}{\sigma(R_m)}$$

Thus the CML equation:

$$E(Rp) = R_f + \left[\frac{E(R_m) - R_f}{\sigma(R_m)}\right]\sigma(Rp) \ldots\ldots\ldots\ldots\ldots\ldots(2.1)$$

According to Coopeland, Weston, and Shastri (2005), if market equilibrium exists, then the price of all assets should adjust until the investor possesses all the assets. There is no excess demand. In other words, the price will be shaped in a certain way that the supply from all assets will be the same as the demand to have those assets. The proportion of every asset in the portfolio is as follows:

w = the market value of individual asset / the market value of all assets

Portfolio that consist of a% that has been invested in risky asset and (1-a%) in a market portfolio has a mean and standard deviation as follows:

$$E(Rp) = aE(R_i) + (1-a)E(R_m) \qquad (2.2)$$

$$\sigma(Rp) = [a^2\sigma_i^2] + [(1-a)^2\sigma_m^2 + 2a(1-a)\sigma_{im}]^{1/2} \qquad (2.3)$$

The changes $E(Rp)$ that occur due to changes:

$$\frac{dE(Rp)}{da} = E(R_i) - E(R_m) \qquad (2.4)$$

Meanwhile, changes $\sigma(Rp)$ due to changes:

$$\frac{d\sigma(Rp)}{da} = \frac{1}{2}[\alpha^2\sigma_i^2 + (1-a)^2\sigma_m^2 + 2a(1-a)\sigma_{im}]^{-1/2}$$

$$= [2a\sigma_i^2 - 2\sigma_m^2 + 2a\sigma_m^2 + 2\sigma_{im} - 4a\sigma_{im}] \qquad (2.5)$$

Equilibrium of excess demand for an asset has to be zero. The price will be adjusted until all assets are owned by someone. If the equation (2.4) and (2,5) is evaluated where the excess demand a is zero, then we can determine the equilibrium price and this becomes an equilibrium for risk. Slope of risk-return trade off in a market equilibrium is as follows:

$$\frac{\frac{dE(Rp)}{da}}{\frac{d\sigma(Rp)}{da}} = \frac{E(R_i - E(R_m)}{\frac{(\sigma_{im} - \sigma_m^2)}{\sigma_m}} \qquad (2.6)$$

Slope of the risk-return trade off has to be the same as the slope of the capital market line, according to Sharpe and Treynor, thus the equation model becomes:

$$\frac{E(R_i) - ER_m}{\frac{(\sigma_{im} - \sigma_m^2)}{\sigma_m}} = \frac{E(R_m) - R_f}{\sigma_m}$$

$$E(R_i) = R_f + [E(R_m - R_f)]\frac{\sigma_{im}}{\sigma_m^2} \qquad (2.7)$$

Equation (2.7) is the CAPM that shows the required rate of return for an asset E(Ri) to be the same as the risk free rate of return plus the premium risk. The premium risk is a the price of the risk multiplied by the quanitity risk in a CAPM terminology:

- The price of a risk is a slope from the equation line (2.7), which is the difference between the expected rate of return from a market portfolio with the risk free rate of return $[E(R_m - R_f)]$.
- The quality of the risk is often referred to as beta (β). $\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$

Thus, the only risk that investors are willing to pay premium to avoid it in a CAPM is the covariance risk (market risk).

Based upon the aforementioned concept, the prediction for the concept above can be applied by empirically examining that return of an asset is a linear function from the market return with random error ε that behaves independently towards the market. It is shown in the following equation:

$$R_j = a_j + b_j R_m + \varepsilon_j \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2.8)$$

Equation (2.1) consists of 3 components:

a_j : Constant without variants

$b_j R_m$: Constant multiplied by a random variable

ε_j : Random variable that has zero covariance with R_m

Variance for relationship that was shown in equation (2.8):

$$\sigma_j^2 = b_j^2 \sigma_m^2 + \sigma_\varepsilon^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.9)$$

Variance (σ_j^2) is a total risk that can be separated into systematic risk $(b_j^2 \sigma_m^2)$ and unsystematic risk risk (σ_ε^2). b_j In a simple linear relationship between individual asset return and market return is the same as β_j in CAPM.

According to Coopeland and Shastri (2005), the first step to empirically test the theoretical CAPM is by transforming from expectation (ex-ante) to observation data. The ex-post form of CAPM:

$$R_{jt} - R_{ft} = \left(R_{mt} - R_{ft}\right) \beta_j + \varepsilon_{jt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.10)$$

When CAPM is tested empirically, the equation becomes as follows:

$$R_{pt} = \delta_0 + \delta_1 \beta_p + \varepsilon_{pt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.11)$$

Where,

$\delta_1 = R_{mt} - R_{ft}$

$R_{pt} = Excess\ return\ portfolio \left(R_{pt} - R_{ft}\right)$

Equation (2.10) is the same as equation (2.11) with the addition of the element of a constant (δ). The equation from the CAPM model can be proven by equation (2.11), which indicates that beta must be the only factor that explains the rate of return of a risky asset. If other components such as residual variance, dividend yield, P/E ration, and firm size are added as predictors, then those variables do not have explanatory power. Additionally, the relationship has to be linear in β so that the power of the beta can be added as an insignificant predictor.

An empirical study conducted by Fama and French (1992) concluded that idiosyncratic risk or unsystematic risk such as size and book to market ratio can better explain the variations of return security than the systematic risk. The aforementioned study was conducted with the two pass regression where the second pass regression was a multiple regression with individual stock returns as the dependent variable. Levy (1978), Merton (1987), Malkiel and Xu (2002), and Naomi Prima (2011) explained the positive relationship between unsystematic risks with stock returns. Fama and Macbeth (1973) examined the positive trade off between return and risk by measuring the risk from the perspective of a portfolio. The study conducted by Brockman and Schutte (2007), Spiegel and Wang (2006) as well as Eiling (2006) found that by using the EGARCH model with either international or US data, there was a positive relationship between idiosyncratic volatility and the average of stock returns. This study also affirmed the findings of Fu (2009), which suggested that the EGARCH model gave proof that was contradicted by the findings of Ang et al. (2006), which suggested that there is a positive relationship between idiosyncratic lag volatility and average stock return, and that the relationship is not only statistically and economically significant but also robust. However, Fu (2009) posited that Ang et al. (2008)'s recent study found a negative relationship between average stock return and idiosyncratic volatility in G7 nations.

An empirical study conducted by Pettengill et al. (1995), on other hand, used realized return to test conditional relationship between beta and return for the up and down market. They found empirical support that affirms the CAPM theory, which suggested that there is a consistant positive relationship between beta and return and that there is a positive relationship when up market and a negative relationship during down market. These findings were further tested by Fletcher (2000) who tested the conditional beta in setting the international capital market and the findings were consistent with Pettengill et al. (1995) who found a flat relationship between beta and return in unconditional relationship between beta and return. Schwert and Seguin (1990) as cited in Sudarsono (2012), who estimated beta by considering the heterodaxity of the time series data, found a more consistent result with the CAPM theory. Sudarsono et al. (2012) stated that early diagnostic that caused inconsistency between the theory with the findings of an empirical study is the research method used to estimate beta that did not match the characteristic of the financial data that often showed time varying volatility. The hypothesis that can be taken based upon the aforementioned literature review is that idiosyncratic risk influences Indonesian stock returns.

2. Research Method

Data used in this research were secondary data in the form of time series data. The data consist of daily stock data LQ54 and daily data from the closing price of the composite stock price index between January 1, 2014 – December 31, 2014. The time frame was chosen because it would provide the most updated set of data for the purposes of this study. Based upon the stock LQ45 in 2014, 40 stocks were routinely added into LQ45 for two semesters in 2014. LQ45 is used because those stocks is the most liquid among all listed in the Indonesian Stock Exchange (ISE).

2.1. Research Variable and The Definition of The Operational Variable

Return of the LQ45 stock is the stock return earned from the investment of a stock. The stock is measured by decreasing the stock price for a period of time with the price of the previous period. The formula to measure the return of LQ45 is as follows:

$$R_i = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Meanwhile, return market is the result of market index gained from the closing price of the composite stock price index for 40 days measured by substracting the combined stock price index of a period of time with the previous composite stock price index. Return market can be measured with the following formula:

$$R_m = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

The creation of stock portfolio refers to Budi Fensidy (2013)'s study that developed the research model from various concepts relating to diversification, which is Markowitz (1952)'s portfolio theory, Roy (1952)'s safety-first theory, Conine and Tamarkin (1981)'s portfolio size for utility function to the power of three theory, and Langer (1975) and Odean (1999)'s theory of portfolio behavioural, illusion of control, and overconfidence. From the aforementioned theories, there concept in shaping a portfolio is as follows:

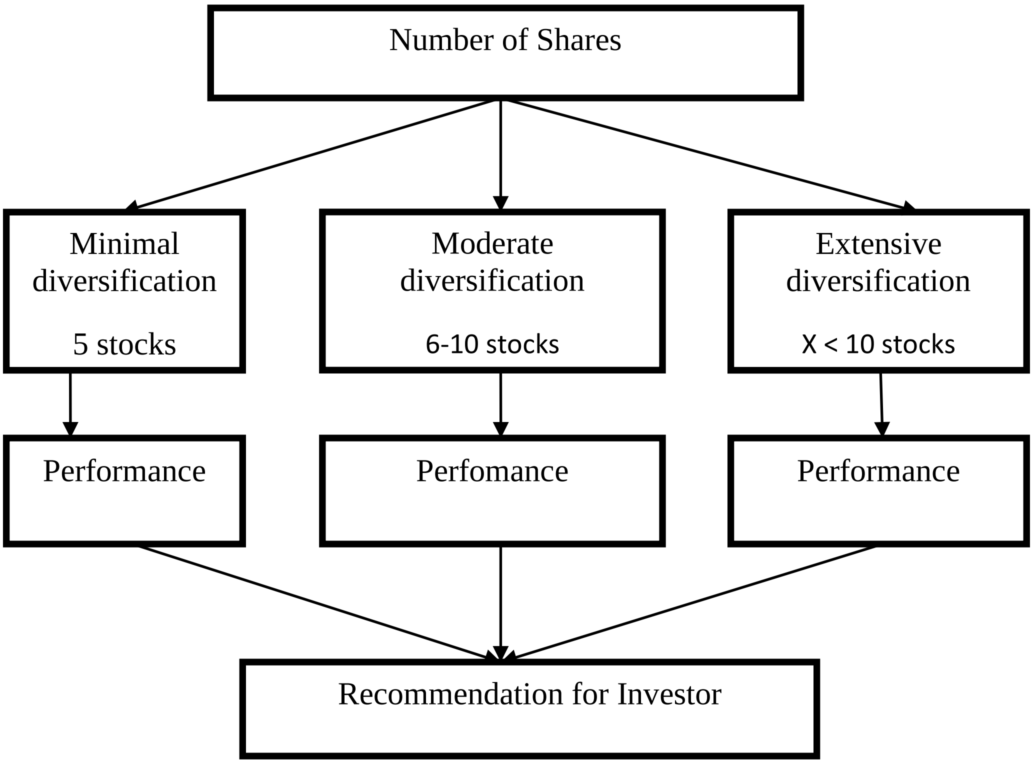

Figure 1. Steps in the Creation of Portfolio

Based upon Figure 1, this study will utilize minimal diversification to invest on many financial assets by combining five shares for every portfolio from various sectors (if in the same sector, then the auto-correlation will be high).

2.2. Data analysis

This study will focus on the role of idiosyncratic risk in explaining the behaviour of stock returns in the Indonesian Stock Exchange. Data analysis in this study was conducted in two stages or by doing the two pass regression. The first pass regression was the first stage of the regression that was created using the daily time series data to estimate the unsystematic risk through the market development model.

$$R_t = \eta + \theta R_{mt} + \varepsilon_t$$

Where,

R_t = Daily stock returns during period t
R_{mt} = Daily stock return (composite stock price index) during period t

Estimation of parameters for the aforementioned model was conducted by applying EGARCH (1,1) if the result of the data estimation showed heterodaxity.

$R_t = \eta + \theta R_{mt} + \varepsilon_t$
$\varepsilon_\tau|\Omega_{t-1} \sim N(0, h_t)$
$\log(\sigma_t^2) = \omega + \delta z_{t-1} + \varphi(|z_{t-1}| - E[|z_{t-1}|] + \beta \log(\sigma_{t-1}^2)$

However, if the result of the data estimation showed homodaxity, then the test must be donewith the ordinary least square (OLS).

Residue that is yielded by the above comparison showed unsystematic risk for a certain stock portfolio during period t. The EGARCH model was used because it could catch the behaviour of the financial time series data that would normally possess heterodaxity (time varying volatility). For that reason, before parameter estimation EGARCH is conducted, data normality test and ARCH effect test will be done. The normality test is used to find out if the variables in the study are normally distributed or not. If the data is not distributed normally, then the data will show the time varying volatility phenomenon. Normality can be detected by using the Jarque-Berra (JB) test to see skewness and kurtosis.

To assure the existence of the ARCH effect, then the ARCH-LM *(Autoregressive Conditional Heterokedasticity – Langrange Multiplier)* test must be done. *Lagrange Multiplier* test is used to test the existence of the ARCH effect in residuals. Residual variance (σ_t^2) is not only a function of an independent variable but also depends upon the residual of the previous period (σ_{t-1}^2) that would then be referred to as the ARCH (p) model or can be written as:

$$\sigma^2 t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \dots + \alpha_2 \varepsilon_{t-p}^2 + e_t$$

In financial data, specific heterodaxity is based upon the size of residual volatility during the study. Abandonment of the residual effect will cause inefficiency in parameter of the estimation result.

$$H_0: \gamma_t = 0$$
$$H_1: \gamma_t \neq 0$$

If $\gamma_t = 0$ then there is no ARCH in the research model, however if $\gamma_t \neq 0$ then ARCH exist in the study. The test follows the chi-squares distribution with degrees of freedom of p, which is $(T - q) \times R^2$ where T is the sample size and q is the *degress of freedom* (in this study, $q = 1$). If $(T - q) \times R^2 \geq X_{1-\alpha,q)}^2$ or probability Obs*X^2 is bigger than $\alpha = 5\%$ then the hypothesis of zero is accepted, which means that there is no ARCH in the research model. However, if $(T - q) \times R^2 \geq X_{1-\alpha,q)}^2$ or probability Obs*X^2 is smaller than $\alpha = 5\%$ then the hypothesis of zero is rejected, it means that ARCH exist in the study. In other words, for those heterodaxtic variables and estimation can be measured using the EGARCH model.

From the 40th stock, a measurement of return is conducted that would then be shaped into the 30 stock return portfolio that consists of five combination of shares from various sectors in each portfolio. Specific model for the second stage of regression is the cross sectional regression from the 30 stock portfolio, that has a purpose of identifying the role of unsystematic risk in explaining the behaviour of return in a stock portfolio. Unsystematic risk gained from specific EGARCH (1,1) is then used as a predictor for the second stage or the second pass regression that uses the cross section data. The model used to estimate every 30 stock portfolio with the cross sectionl regression is as follows:

$$R_i = \gamma_0 + \gamma_1 \beta_i + \gamma_2 Idio_i + \varepsilon_{it}$$

Where,

i : 1,2,…, n

R_i : Stock portfolio return i

β_i : Stock market portfolio risk

$Idio_i$: Stock portfolio unsystematic risk i.

Parameter γ_2 in the equation above is used to measure the role of unsystematic risk in explaining the behaviour of return in stock portfolio. If γ_2 differs significantly from zero, then there exist empirical evidence that indicate that β is not the only relevant risk in explaining the behaviour of stock return portfolio.

To have an estimator that is BLUE, before cross sectional regression test is conducted, a diagnostic test on the residue from the equation above is done along with auto-correlation test and heterodaxity test. Heterodaxity test is done according to the white test procedure while detecting multico-linearity was not done in this study because theorectically, unsystematic risk is a unique or specific risk that is not correlated with systematic risk.

Possible issues that may arise in the cross sectional regression is regarding the residue with variance that is not constant (heterodaxic). This may arise because stocks with high beta also have returns with high variance. As a pre-emptive measure to this issue, the regression in certain stock portfolios with heterodaxic characteristics will be closely examined during the cross sectional regression and the parameter will be measured with the generalized least squares.

3. Results and Discussion

In accordance with the research objective, data analysis of this study was done in two stages (two pass regression). The first pass regression was a regression that estimated using the daily time series data to identify the average unsystematic risk of stock portfolios. The estimation technique utilised was based upon the individual stock data characteristic test that included a test to measure the existence of the ARCH structure in the stock return result and data normality test.

Table 1. Data Normality Test of LQ45 Stock Return

Share	Prob. Jarque-Berra	Skewness	Kurtosis	Saham/ Share	Prob. Jarque-Berra	Skewness	Kurtosis
AALI	0.000	0.368	5.384	INTP	0.000	0.072	5.941
ADHI	0.000	0.124	6.154	ITMG	0.000	-0.464	5.573
ADRO	0.112	-0.138	3.612	JSMR	0.000	0.548	6.026
AKRA	0.000	-0.097	4.549	KLBF	0.000	0.170	4.584
ASII	0.000	-0.272	4.984	LPKR	0.000	0.490	5.157
ASRI	0.000	-0.062	5.912	LSIP	0.494	0.075	3.350
BBCA	0.000	-0.006	6.617	MNCN	0.050	0.111	3.752
BBNI	0.000	0.073	5.676	PGAS	0.000	0.423	5.475
BBRI	0.000	0.907	0.073	PTBA	0.031	0.337	3.511
BDMN	0.000	0.265	5.078	PTPP	0.000	0.134	7.210
BMRI	0.000	0.616	8.176	PWON	0.000	0.888	9.237
BMTR	0.000	0.490	5.119	SMGR	0.000	0.103	4.825
BSDE	0.000	0.320	6.307	SMRA	0.031	-0.005	3.845
CPIN	0.000	0.172	4.478	TAXI	0.000	0.453	4.266
CTRA	0.000	-0.930	8.432	TBIG	0.000	0.533	4.924
EXCL	0.069	0.212	3.609	TLKM	0.000	-0.253	4.446
GGRM	0.192	0.126	3.526	UNTR	0.035	-0.319	3.533
HRUM	0.000	0.742	6.500	UNVR	0.021	0.183	3.812
ICBP	0.000	0.289	6.300	WIKA	0.000	-0.018	7.879
INDF	0.000	0.103	5.639	WSKT	0.000	1.092	9.305

Table 1 showed that a large portion of the stock return data of individual stocks with the Jarque-Berra testing procedure is not normally distributed. As such is the result of the normality test that indicated a large portion of the data having a curtosis value of more than three, thus indicating the distribution as leptokurtic.

The heterodaxity test (time varying volatility) was done with the ARCH effect test, which was through the ARCH-LM procedure to determine the existence of the ARCH effect in a stock return data. The result of the test is as follows:

Table 2. ARCH-LM Residual Test

Share	Prob. Chi-Square	Share	Prob. Chi-Square
AALI	0.145	INTP	0.748
ADHI	0.918	ITMG	0.305
ADRO	0.203	JSMR	0.610
AKRA	0.678	KLBF	0.538
ASII	0.617	LPKR	0.571
ASRI	0.665	LSIP	0.197
BBCA	0.966	MNCN	0.914
BBNI	0.506	PGAS	0.022*
BBRI	0.347	PTBA	0.031*
BDMN	0.038*	PTPP	0.969
BMRI	0.402	PWON	0.805
BMTR	0.798	SMGR	0.812
BSDE	0.001*	SMRA	0.104
CPIN	0.366	TAXI	0.796
CTRA	0.716	TBIG	0.926
EXCL	0.072	TLKM	0.770
GGRM	0.005*	UNTR	0.303
HRUM	0.881	UNVR	0.081
ICBP	0.824	WIKA	0.485
INDF	0.660	WSKT	0.571

Based upon the ARCH effect test, there was 35 return with homodaxic traits and there was no ARCH effect, thus the ordinary least squares (OLS) method was used to estimate. Meanwhile, the 5 LQ45 stock returns are: BDMN, BSDE, GGRM, PGAS, and PTBA showed heterodaxity and ARCH effect, thus the estimation model used was the EGARCH model.

The result of the beta estimation and unsystematic model that was estimated with the EGARCH (1,1) method and OLS method is shown in the table below.

Table 3. Beta Estimation Result and Unsystematic Risk

Share	Beta	Idio	Share	Beta	Idio
AALI	1.129208	-7.63E-18	INTP	1.26546	0.000
ADHI	2.01647	-3.64E-18	ITMG	1.07353	4.86E-18
ADRO	1.639583	1.59E-17	JSMR	1.3475	9.96E-18
AKRA	1.055226	-4.32E-18	KLBF	1.13402	0.000
ASII	0.984099	2.62E-18	LPKR	1.48206	-2.65E-18
ASRI	1.861497	0.000	LSIP	0.6172	2.29E-18
BBCA	1.074738	8.67E-18	MNCN	0.60392	1.13E-18
BBNI	1.589065	1.34E-18	PGAS	1.89122	-0.0005361
BBRI	1.90862	4.86E-18	PTBA	1.51777	0.0020319
BDMN	1.202461	-9.46E-05	PTPP	1.54719	-5.03E-18
BMRI	2.032913	-8.54E-18	PWON	2.61372	1.01E-17
BMTR	0.937856	3.00E-18	SMGR	1.37313	-4.60E-18
BSDE	3.218361	-0.000807	SMRA	1.7672	3.64E-18
CPIN	1.512481	5.64E-18	TAXI	0.48174	4.77E-18
CTRA	1.477051	0.000	TBIG	0.26481	-7.59E-18
EXCL	0.828393	-1.39E-17	TLKM	1.11427	-1.74E-18
GGRM	0.610654	-0.005167	UNTR	0.94072	-3.90E-18
HRUM	0.841746	1.56E-18	UNVR	1.20636	-6.70E-18
ICBP	1.117054	-3.47E-18	WIKA	1.94458	3.64E-18
INDF	0.629225	7.81E-19	WSKT	2.90274	1.69E-17

The estimation method in the second pass regression stage is the ordinary least squares, which was used to determine the parameter from the month by month sectional regression. Before the cross sectional regression test was conduced, further testing for auto-correlation and heterodaxity was done as shown in the following table:

Table 4. Auto-correlation Test and Heterodaxity Test

Month	Auto-correlation Test Prob. Chi-Square	Heterodaxity Test Prob.Chi-Square
January	0.3287	0.0931
February	0.1476	0.9217
March	0.0128*	0.8279
April	0.3397	0.4201
May	0.4132	0.6849
June	0.3597	0.9263
July	0.3404	0.5047
August	0.4212	0.5039
September	0.5412	0.8114
October	0.6174	0.3628
November	0.1981	0.9315
December	0.5359	0.8648

From the test result the test in Table 4, one can glean that there was no heterodaxity from January through December. Meanwhile, in the auto-correlation test, if prob.chi-square < α, there was auto-correlation. The results listed in Table 4 showed auto-correlation in March due to the prob.chi-square value of 0.0128, which was smaller than $\alpha = 0.05$.

The purpose of the diagnostic test was to have the best and unbiased OLS estimator. The result of the OLS estimator was used to estimate the parameter of the month by month cross sectional regression in the following table.

Table 5. Parameter of Unsystematic Risk Estimation Result

Month	Idiosyncratic Coefficient
January	-3.43331E-19
February	-2.74665E-19
March	-1.30104E-19
April	-5.20417E-19
May	-3.46945E-19
June	5.96311E-19
July	3.52366E-19
August	0.000
September	9.97466E-19
October	-1.85037E-18
November	2.3491E-19
December	-4.11997E-19

The test of significance of the influence of unsystematic risk towards the stock return portfolio utilised the idiosyncratic risk coefficient, which was the result of the month by month cross sectional regression listed on the table above that has passed the series of diagnostic test. The portfolio based on 40 stocks that have calculated their returns was then changed into 30 returns portfolio that consisted of 5 shares from various sectors in each portfolio. The idiosyncratic risk coefficient (estimator γ_2) in Table 5 was then used to calculate the final estimate of γ_2 and its variances.

The result can be seen below.

Table 6. Descriptive Statistics for the Unsystematic Risk Coefficient

Mean	-1.41E-19
Std. Dev.	7.06E-19
Skewness	-0.816993
Kurtosis	4.235108
Jarque-Bera	2.0977
Probability	0.35034
Observations	12

The descriptive statistics on Table 6 showed the mean and standard deviation for estimator γ_2 (unsystematic risk coefficient). The t test was used to test the significance of the influence of unsystematic risk towards the stock returns through a significance test of the mean. This t test required the data to be normally distributed with the Jarque-Berra probability of 0.35034 as shown on the table as bigger than α = 5%, which indicated that the unsystematic risk coefficient is normally distributed.

To test the significance of the mean of the unsystematic risk, a simple hypothesis test is conducted and can be seen in the following table:

Table 7. ***Simple Hypothesis Test***

Test of Hypothesis: Mean = 0.000000

Sample Mean = -1.41e-19		
Sample Std. Dev. = 7.06e-19		
Method	Value	Probaility
t-statisic	-0.693652	0.5023

The t-statistic of 0.5023 indicated that the unsystematic risk did not have a significance influence on the return of stocks. This finding supports the theories postulated by CAPM, which stated that the only risk that influences stock return is a systematic one. This was caused the minimal unsystematic risk caused by the diversification of asset that was done by investor, leaving market risk as the only relevant risk. The most fundamental aspect of CAPM testing is the beta estimation during the first pass regression stage. The estimation of beta through the first pass regression in this study was done with the consideration of the characteristic of the time series data that was normally heterodaxic and is not normally distributed. The result of said estimation relates with the decision made by the investor who was going to invest in the capital market, as he/she has to closely examine risks that influences the stock returns since thus far, the empirical findings of CAPM testing has not been able to consistently explain the phenomenon of the relationship between systematic risk (beta) and stock returns.

A few studies have shown that there is a factor that could explain the return of a security other than beta, such as a study done by Basu (1977) that found that portfolio with a low price earning ration has an influence towards the rate of return that is higher than what the CAPM predicted. Banz and Reinganum (1981) also found that the size of firm played a role in explaining return, with smaller companies having an abnormally high return rate. Preversely, the findings of Schwert and Seguin (1990) as cited in Sudarsono (2012), who estimated beta while considering heterodaxity of time series data, was more consistent with the CAPM theory. Sudarsono et al. (2012) stated that early diagnostic that caused inconsistency between the theory with the findings of an empirical study is the research method used to estimate beta that did not match the characteristic of the financial data that often showed time varying volatility.

4. Conclusion

The purpose of this study was to research about the influence of unsystematic risk and market risk (beta) on stock returns of shares in Indonesia from the periods of January 2014 through December 2014 using the two pass regression. The first pass regression was the market model regression that was developed to identify unsystematic risk by using daily time series data. The chosen estimation model was based upon the characteristic of return data, which was the EGARCH (1,1) method for heterodaxic data and OLS for data with constant variation. Specific model for the second pass regression with using the cross section data was the month by month cross sectional regression from 30 stock portfolios with the purpose of identifying the role of unsystematic risk in explaining the behaviour of returns in share portfolios. The findings of this study indicated that unsystematic risk does not have significant influence on stock returns. These findings is consistent with the CAPM, which stated that the the only relevant risk in explaining the return of a share is a systematic one, thus there are no statistical data that is strong enough to disprove the aforementioned theory.

This study utilised portfolio analysis unit that was built with a random approach. For further consistent testing of the findings, further research can be done using the portfolios with other approaches, such as the Markowitz approach. Additionally, further conditional CAPM testing can be done using a dual beta. Thus investors who are going to invest in the Indonesian Stock Exchange must first pay close attention to risk that influence the return of shares. If the risk can influence the return of the share is a systematic risk, then he/she can invest short-term so that the return will earned in the form of capital gain.

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